

The addition of Silica filler had resulted some improvement in the electrical and mechanical properties of PVC.

GWO gives definite indications of filler percentage to obtain the optimal values of dielectric strength and tensile strength.

1-For low temperatures at (0°C), the PVC dielectric strength was improved by the increase of Silica concentrations by almost 42% for 30wt%, except in 40%wt it decreased.

2-Under wet condition ,the PVC dielectric strength of samples were immersed for 24 hrs was improved by the increase of Silica concentrations by almost 42.3% for 30wt%, except in 40%wt it decreased.

3- It can be concluded that, the suitable percentages of Silica filler can be added to PVC which determined by applying GWO are:

- 30% of Silica filler to obtain the best optimal value of dielectric strength 30.76 kV/mm at 0°C.
- 30% of silica filler to obtain the best optimal value of dielectric strength 26.53 kV/mm under wet condition for 24 h.

4-The best solution obtained by GWO is 20.9% of Silica filler to obtain the best optimal value of tensile strength.

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